

Space Needs Modeling

INTRODUCTION

The Office of Facilities and Institutional Planning from CPE provided Fall 2004 facilities inventory, staff full time equivalents, and research expenditure data for each of the institutions. The Council also provided enrollment, staffing and research expenditure projections for year 2020. This section provides an overview of the space model, the results of its application for both the base year and the projected year, and recommendations on how the model should be updated to reflect the unique qualities of Kentucky's institutions, current trends in instructional delivery methods and spaces of the future.

Paulien & Associates, Inc. was contracted in 1999 to develop a space need model for CPE. At that time, the Kentucky Community and Technical College System had just been organized and the community colleges and technical colleges were being reorganized under one system. The technical colleges did not have a comprehensive dataset that could be analyzed with a high degree of confidence. Therefore, the consultants relied on their knowledge of community and technical colleges to inform the process. The model developed intended to reflect the unique needs of the different missions under the newly formed community and technical college system. Since then, the Council has updated and changed the model to exhibit a unified system and newly formed districts.

The existing assignable square footage (ASF) used in the model reflects educational and general (E&G) state supported space only. It does not include hospital space, farms, and locations (remote locations and service centers) off the main campus. This is important as the student and staff full-time equivalents (FTE) include all students and staff for an institution. KCPE provided a dataset of the spaces to be included in the model. It was the consultants' understanding that the non E&G spaces were removed. As the study progressed, the consultants found parking garages, leased space, farm space, and other spaces that typically should have been excluded in the model actually included at individual institutions. Where possible, the consultants excluded these spaces. Council staff was informed of these anomalies, and agreed that these adjustments should be made. In future applications of the space model, the consultants encourage the Council and the institutions to review the spaces carefully so that each institution is being measured appropriately against the model.

SUMMARY OF FINDINGS

Changes to the Space Needs Model

Paulien & Associates was asked to review the model to make sure that it was reflective of today's instructional delivery methods, provided adequate space for facilities in the 21st Century, and promoted the level of education the State of Kentucky wanted to provide its constituents. The Council requires a tool with which to measure facilities needs at each of its institutions. After careful consideration, the consultants recommend changes to the space standards in three areas. The changes are as follows:

- *increase the classroom space factor for the comprehensive universities and the community and technical colleges:*
 - *comprehensive universities increase to 12 assignable square feet (ASF) per student full-time equivalent (FTE) from 10 ASF per student FTE*
 - *community and technical colleges increase to 15 ASF per student FTE from 10 ASF per student FTE*
- *increase the office space factor for the comprehensive universities and the community and technical colleges*
 - *comprehensive universities increase to 195 ASF per staff full- equivalent (FTE) from 170 ASF per staff FTE*

- community and technical colleges increase to 170 ASF per staff FTE from 150 ASF per staff FTE
- provide an additional 4 ASF per student FTE in support space for those institutions with a land grant mission (University of Kentucky and Kentucky State University)

The changes in classroom space reflect the need for more space per student station required by today's instructional methods (collaborative learning), furniture styles, and sight-lines needed for the use of multi-media. Most of the comprehensive universities and community and technical colleges have not reached an economy of scale in student size to allow a variety of classroom styles and seating arrangements.

Increasing the office space factor in the comprehensive universities and community colleges is more of a reflection of the constraints in existing facilities than the need for more space per faculty and staff. Older buildings tend to have larger office sizes and without significant renovation dollars, retrofitting these spaces is very difficult.

The University of Kentucky and Kentucky State University both have land grant missions which typically require additional support space. The consultants felt that consideration needed to be given to both of these institutions due to their unique missions; therefore, an additional 4 ASF per student FTE was provided in support space.

Space Needs Model Outcomes

The Fall 2004 application of the model shows a deficit of approximately 728,000 ASF systemwide. The major space deficit is in research space (778,500 ASF) and in special use and general use space (361,000 ASF). Shortages also exist in open laboratories, physical education and recreation space, and teaching laboratories. The institutions with the most need include the University of Louisville with a 645,000 ASF space shortage, Western Kentucky University with a 285,000 ASF shortage, Bluegrass Community & Technical College with a 265,000 ASF space deficit, Jefferson Community & Technical College with a 225,000 ASF shortage, and Northern Kentucky University with a 202,000 ASF space need.

Space Needs Model

Space Category	Fall 2004 Student FTE = 147,006 Staffing FTE = 23,051 Research Expenditures = \$334,074,855				2020 Student FTE = 232,582 Staffing FTE = 38,128 Research Expenditures = \$1,041,225,963		
	Existing ASF	Guideline ASF	Surplus/ (Deficit)	Percent Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)	Percent Surplus/ (Deficit)
Classrooms & Service	2,089,321	1,836,599	252,722	12%	2,879,109	(828,839)	(40%)
Teaching Laboratories	2,290,520	2,400,186	(109,666)	(5%)	3,625,654	(1,371,738)	(61%)
Open Laboratories	926,457	1,125,601	(199,144)	(21%)	1,789,379	(882,334)	(97%)
Research Laboratories	1,279,609	2,057,969	(778,360)	(61%)	4,598,599	(3,330,400)	(263%)
Office Suites	4,826,247	4,376,970	449,277	9%	7,268,260	(2,475,543)	(52%)
Library	1,513,342	1,513,342	0	0%	1,509,218	0	0%
Physical Education & Recreation	958,774	1,136,112	(177,338)	(18%)	1,832,872	(874,098)	(91%)
Special Use & General Use Space	2,100,778	2,461,647	(360,869)	(17%)	3,947,373	(1,850,826)	(88%)
Support Space	1,267,565	1,072,424	195,141	15%	1,747,172	(482,184)	(38%)
TOTAL	17,252,613	17,980,850	(728,237)	(4%)	29,197,636	(12,095,962)	(71%)

ASF = Assignable Square Feet

Applying the 2020 projections to the model shows a 71% deficit or a need for 12.1 million ASF with significant shortages in every space category. Again, research laboratories show a 3.3 million ASF shortage followed by a 2.5 million ASF shortage in office space. The doctoral universities represent 47% of the shortage followed by the

comprehensive universities at 34% and KCTCS at 18% of the total KCPE space shortage. Every institution except Bowling Green Technical College shows a space deficit.

Space Needs Model Summary by Institution

Institution	Fall 2004				2020		
	Existing ASF	Guideline ASF	Surplus/ (Deficit)	Percent Surplus/ (Deficit)	Guideline ASF	Surplus/ (Deficit)	Percent Surplus/ (Deficit)
Doctoral Universities							
University of Kentucky	4,326,941	4,238,754	88,187	2%	7,556,381	(3,229,440)	(75%)
University of Louisville	2,476,144	3,120,784	(644,640)	(26%)	5,025,852	(2,549,708)	(103%)
Subtotal	6,803,085	7,359,538	(556,453)	(8%)	12,582,234	(5,779,149)	(85%)
Comprehensive Universities							
Eastern Kentucky University	1,634,906	1,411,177	223,729	14%	2,305,186	(670,280)	(41%)
Kentucky State University	482,227	379,125	103,102	21%	656,840	(174,613)	(36%)
Morehead State University	861,551	782,006	79,545	9%	1,196,076	(334,525)	(39%)
Murray State University	1,209,822	882,619	327,203	27%	1,440,950	(231,128)	(19%)
Northern Kentucky University	917,163	1,119,296	(202,133)	(22%)	2,067,303	(1,150,140)	(125%)
Western Kentucky University	1,272,008	1,556,789	(284,781)	(22%)	2,710,977	(1,589,908)	(142%)
Subtotal	6,377,677	6,131,012	246,665	4%	10,377,332	(4,150,594)	(67%)
Community & Technical Colleges							
Ashland Community and Technical College	250,594	225,617	24,977	10%	311,059	(60,465)	(24%)
Big Sandy Community and Technical College	332,669	269,508	63,161	19%	373,446	(40,777)	(12%)
Bluegrass Community and Technical College	451,201	716,548	(265,347)	(59%)	1,004,460	(553,259)	(123%)
Bowling Green Technical College	178,683	111,866	66,817	37%	156,304	22,379	13%
Elizabethtown Community College	240,066	278,833	(38,767)	(16%)	389,333	(149,267)	(62%)
Gateway Community and Technical College	143,145	123,459	19,686	14%	173,677	(30,532)	(21%)
Hazard Community and Technical College	316,686	252,367	64,319	20%	344,983	(28,297)	(9%)
Henderson Community College	97,924	106,543	(8,619)	(9%)	145,643	(47,719)	(49%)
Hopkinsville Community College	120,568	177,342	(56,774)	(47%)	244,798	(124,230)	(103%)
Jefferson Community and Technical College	451,330	677,078	(225,748)	(50%)	942,108	(490,778)	(109%)
Madisonville Community College	203,712	212,574	(8,862)	(4%)	295,466	(91,754)	(45%)
Maysville Community College	161,016	149,464	11,552	7%	208,352	(47,336)	(29%)
Owensboro Community and Technical College	212,660	259,499	(46,839)	(22%)	358,371	(145,711)	(69%)
Somerset Community College	355,698	341,717	13,981	4%	475,371	(119,673)	(34%)
Southeast Kentucky Community and Technical College	261,096	253,011	8,085	3%	351,169	(90,073)	(34%)
West Kentucky Community and Technical College	294,803	334,874	(40,071)	(14%)	463,530	(168,727)	(57%)
Subtotal	4,071,851	4,490,300	(418,449)	(10%)	6,238,070	(2,166,219)	(53%)
TOTAL	17,252,613	17,980,850	(728,237)	(4%)	29,197,636	(12,095,962)	(71%)

ASF = Assignable Square Feet

CAPITAL NEEDS

In order to determine the capital needs for KCPE, the consultants converted assignable square footage (net) to gross square footage. KCPE's current net to gross average is approximately 66%. With the current trend to make sure buildings have enough staff and student collaborative learning spaces outside the classroom, the consultants felt it was reasonable to lower the conversion factor from the current average. The net to gross conversion factor used for this analysis was 62%.

In order to determine the capital needed to construct the necessary facilities, the consultants reviewed the deficits by space category for each institution. For this analysis teaching laboratories and open laboratories were combined into one category – Instructional Laboratories. The space categories that showed existing deficits were converted to gross square footage (GSF) for a total GSF need. While this method for determining needs may be slightly overstated, without a detailed master plan, it is uncertain as to whether space categories that show surpluses can be converted to other uses or whether the surplus is an economy of scale issue (i.e., one would not build a partial gymnasium). The table below shows the total GSF needed by campus for both the 2004 and 2020 space model applications. The detailed tables of the conversion are attached to this report.

Space Model GSF Needs Findings

Institution	2004 Total Gross Square Feet Needed	2020 Total Gross Square Feet Needed
Doctoral Universities		
University of Kentucky	749,295	5,295,180
University of Louisville	1,063,766	4,112,434
<i>Doctoral Universities Total</i>	1,813,061	9,407,614
Comprehensive Universities		
Eastern Kentucky University	16,761	1,081,866
Kentucky State University	74,864	340,574
Morehead State University	22,118	553,787
Murray State University	3,147	373,278
Northern Kentucky University	332,614	1,855,064
Western Kentucky University	624,261	2,564,368
<i>Comprehensive Universities Total</i>	1,073,765	6,768,937
Community & Technical Colleges		
Ashland Community and Technical College	21,105	114,443
Big Sandy Community and Technical College	25,011	88,218
Bluegrass Community and Technical College	456,980	892,353
Bowling Green Technical College	14,144	24,131
Elizabethtown Community College	62,527	240,753
Gateway Community and Technical College	42,600	82,748
Hazard Community and Technical College	0	101,189
Henderson Community College	40,330	91,251
Hopkinsville Community College	92,922	200,371
Jefferson Community and Technical College	364,111	791,576
Madisonville Community College	42,391	147,990
Maysville Community College	14,442	76,348
Owensboro Community and Technical College	81,897	235,018
Somerset Community College	41,840	195,242
Southeast Kentucky Community and Technical College	11,271	145,278
West Kentucky Community and Technical College	87,419	272,141
<i>Community & Technical Colleges Total</i>	1,398,990	3,699,050
TOTAL	4,285,816	19,875,601

Note: Assumes a 62% net to gross ratio.

Once the gross square footage was determined it was converted to capital dollars. The construction costs were determined by space category as follows:

- \$280 per GSF for Classrooms, Offices, Physical Education & Recreation, Special Use & General Use Space, and Support Space
- \$350 per GSF for Instructional Laboratories which include teaching and open laboratories
- \$400 per GSF for Research Laboratories

The table below shows the summary by institution for 2004 and 2020. The detailed tables showing calculations by space category are attached to this report.

Space Model Capital Needs Findings

Institution	2004 Total Capital Needed	2020 Total Capital Needed
Doctoral Universities		
University of Kentucky	\$274,921,100	\$1,840,861,360
University of Louisville	375,280,750	1,444,510,340
<i>Doctoral Universities Total</i>	\$650,201,850	\$3,285,371,700
Comprehensive Universities		
Eastern Kentucky University	\$4,693,080	\$317,159,920
Kentucky State University	29,945,600	117,137,980
Morehead State University	8,106,470	166,350,540
Murray State University	881,160	109,632,110
Northern Kentucky University	98,095,230	544,590,170
Western Kentucky University	187,713,630	769,409,960
<i>Comprehensive Universities Total</i>	\$329,435,170	\$2,024,280,680
Community & Technical Colleges		
Ashland Community and Technical College	\$5,909,400	\$35,886,690
Big Sandy Community and Technical College	7,003,080	26,344,150
Bluegrass Community and Technical College	145,151,930	282,049,110
Bowling Green Technical College	3,960,320	6,756,680
Elizabethtown Community College	18,054,680	73,451,280
Gateway Community and Technical College	11,928,000	23,574,320
Hazard Community and Technical College	0	32,138,890
Henderson Community College	13,248,760	29,386,490
Hopkinsville Community College	31,270,050	64,768,760
Jefferson Community and Technical College	116,815,930	249,748,520
Madisonville Community College	14,109,130	47,662,090
Maysville Community College	4,043,760	22,663,970
Owensboro Community and Technical College	23,827,370	71,417,570
Somerset Community College	11,715,200	59,319,680
Southeast Kentucky Community and Technical College	3,155,880	45,058,790
West Kentucky Community and Technical College	28,218,470	86,486,680
<i>Community & Technical Colleges Total</i>	\$438,411,960	\$1,156,713,670
TOTAL	\$1,418,048,980	\$6,466,366,050

EXISTING SPACE MODEL

The existing space model is shown below. The majority of the space categories are calculated against student FTE (recommended ASF/Student FTE times Student FTE). Office space is calculated based upon staff FTE requiring office space. Research space is based upon research expenditures.

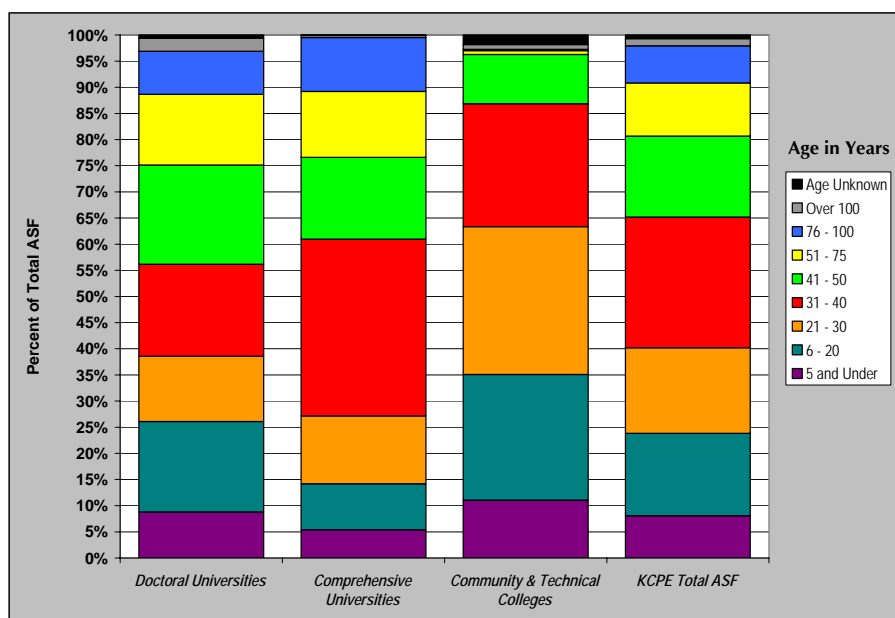
Space Modeling Factors

Space Category	Doctoral Universities	Comprehensive Universities	Community & Technical Colleges
Classrooms & Service	10 ASF/Student FTE	10 ASF/Student FTE	10 ASF/Student FTE
Teaching Laboratories	8 ASF/Student FTE	10 ASF/Student FTE	30 ASF/Student FTE
Open Laboratories	8 ASF/Student FTE	8 ASF/Student FTE	7 ASF/Student FTE
Research Laboratories	900 ASF/\$100,000 for the first \$50M in R&D Expenditures; 600 ASF/\$100,000 for the second \$50M in R&D Expenditures; 350 ASF/\$100,000 over \$100M in R&D Expenditures	700 ASF/\$100,000 R&D Expenditures (IPEDS)	No Standard
Office	195 ASF/Staff FTE	170 ASF/Staff FTE	150 ASF/Staff FTE
Library	No Standard	No Standard	No Standard
Physical Education & Recreation	12.1 ASF for 100% Undergraduate FTE, 25% of Graduate FTE, and 15% of Staffing FTE (75,000 ASF minimum)	12.1 ASF for 100% Undergraduate FTE, 25% of Graduate FTE, and 15% of Staffing FTE (75,000 ASF minimum)	If existing space, then existing space is guideline
Special Use & General Use Space	21 ASF/Student FTE	18 ASF/Student FTE	12 ASF/Student FTE
Support Space	8 ASF/Student FTE	8 ASF/Student FTE	4 ASF/Student FTE

EXISTING SPACE DISTRIBUTION

Age of Existing Facilities

Approximately 35% of all E&G KCPE space is over 40 years old. The comprehensive universities have the least proportionate amount of new space with less than five percent (5%) of its space younger than five years old. Less than 15% of its space is 20 years or less compared to the doctoral universities which have slightly more than 25% of their space 20 years or less. Both the doctoral universities and the comprehensive universities have about 25% of their space in facilities 50 years and older. Less than five percent (5%) of the community and technical college space is over 50 years old.

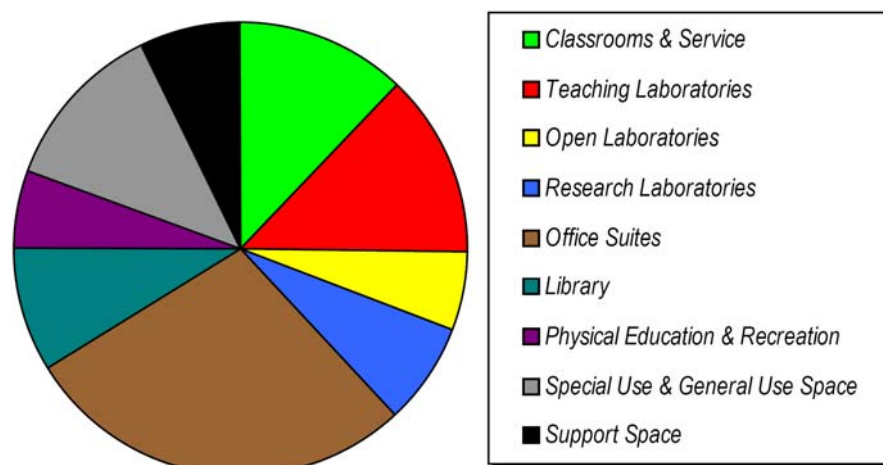


Space Distribution and Average Assignable Square Footage per Student FTE

Currently KCPE has 117 ASF per student FTE (total E&G space divided by 147,006 student FTE) which is an institutional average of 108 ASF per student FTE. The range of space in each of the nine space categories widely varies depending on mission and the type of institution. Bluegrass Community & Technical College has the least amount of space at 52 ASF per student FTE and Kentucky State University has the most at 255 ASF per student FTE. The doctoral universities average 169 ASF per student FTE while the comprehensive universities average 134 ASF per student FTE. The community and technical colleges average 91 ASF per Student FTE.

Twenty-eight (28%) of all space is in the office category. Instructional space accounts of 30% of the total, which included classrooms, teaching laboratories and open laboratories. Special use and general use space accounts for 12% of the total. Profiles for each institution type are attached to this report.

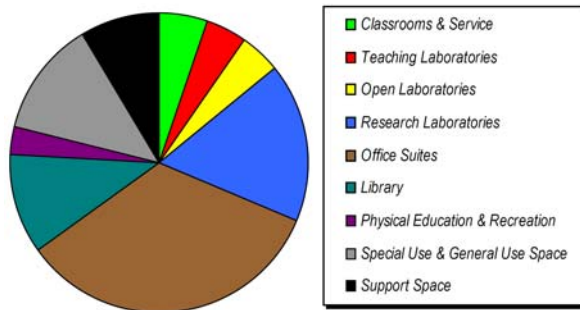
Space Category	Existing Facilities		Institution Averages	
	ASF per Student FTE	% of Total	Average ASF per Student FTE	Range of ASF
Classrooms & Service	14	12%	17	8 - 37
Teaching Laboratories	16	13%	26	5 - 66
Open Laboratories	6	5%	5	.48 - 15
Research Laboratories	9	7%	5	.04 - 36
Office Suites	33	28%	25	13 - 63
Library	10	9%	8	1 - 20
Physical Education & Recreation	7	6%	10	.24 - 59
Special Use & General Use Space	14	12%	12	.41 - 32
Support Space	9	7%	7	2 - 23
TOTAL	117	100%	108	52 - 255



Space Comparison by Institution Type

On the following page is the space distribution by institution type. One of the most noticeable differences among the institution types is the amount of instructional laboratory space (teaching laboratories and open laboratories). At the doctoral universities these space types are about eight percent (8%) of the total space whereas at the community and technical colleges it is about 39% of the space total. The comprehensive universities have about 16% of their space in instructional laboratories. At the doctoral universities research space accounts for about 17% of its space whereas at the comprehensive universities it is about one percent (1%).

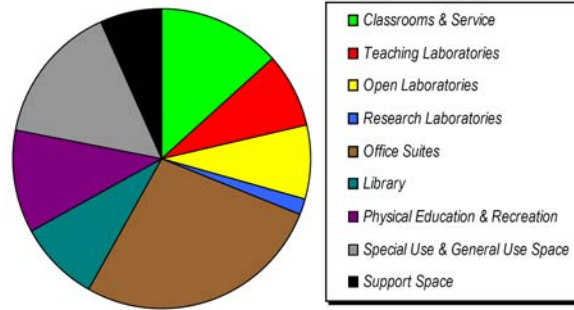
Doctoral Universities



ASF = Assignable Square Feet

Space Category	Existing Facilities		Institution Averages	
	ASF per Student	% of Total	Average ASF per Student	Range of ASF
Classrooms & Service	9	5%	9	8 - 10
Teaching Laboratories	8	4%	7	5 - 9
Open Laboratories	8	4%	8	6 - 10
Research Laboratories	30	17%	29	22 - 36
Office Suites	58	34%	57	52 - 63
Library	19	11%	19	18 - 20
Physical Education & Recreation	5	3%	6	5 - 6
Special Use & General Use Space	22	12%	22	21 - 22
Support Space	15	9%	14	4 - 23
TOTAL	173	100%	169	148 - 191

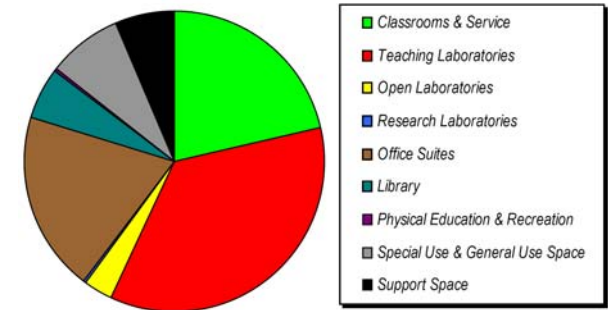
Comprehensive Universities



ASF = Assignable Square Feet

Space Category	Existing Facilities		Institution Averages	
	ASF per Student	% of Total	Average ASF per Student	Range of ASF
Classrooms & Service	15	13%	16	10 - 21
Teaching Laboratories	9	8%	12	6 - 25
Open Laboratories	9	8%	9	4 - 15
Research Laboratories	2	1%	3	.29 - 8
Office Suites	31	27%	35	23 - 61
Library	10	9%	11	7 - 20
Physical Education & Recreation	13	11%	20	4 - 59
Special Use & General Use Space	16	15%	19	7 - 32
Support Space	7	7%	10	3 - 18
TOTAL	112	100%	134	83 - 255

Community & Technical Colleges



ASF = Assignable Square Feet

Space Category	Existing Facilities		Institution Averages	
	ASF per Student	% of Total	Average ASF per Student	Range of ASF
Classrooms & Service	17	21%	19	9 - 37
Teaching Laboratories	29	36%	33	13 - 66
Open Laboratories	2	3%	3	.48 - 8
Research Laboratories	0	0%	1	.04 - 2
Office Suites	16	19%	17	13 - 26
Library	5	6%	5	1 - 10
Physical Education & Recreation	0	0%	1	.24 - 3
Special Use & General Use Space	6	8%	8	.41 - 25
Support Space	5	7%	6	2 - 19
TOTAL	81	100%	91	52 - 143

SPACE NEEDS MODEL

The report content below contains updated information from the 1999 study conducted by Paulien & Associates, Inc.

Classroom Space (100's)

KCPE officials provided the consultants with Fall 2005 utilization statistics. The utilization of KCPE classrooms is less than the proposed utilization targets from the 1999 study of 36 hours per week at 67% student station occupancy. The current utilization rates for the four-year institutions are 23.5 hours per week at 66% student station occupancy. While the student station occupancy is close to the targets the average hours per week are lower than one would expect to see which may suggest that the average weekly room hours may be set too high or that rooms are being identified as classrooms that should be counted in other space categories.

It should be noted that there has been a significant change in the way classrooms are utilized (see the article, 'The Changing College Classroom,' by Daniel K. Paulien, Facilities Manager, November 1998, APPA: The Higher Education Facilities Association, Alexandria, VA). As campuses have been teaching more and more adult students, there has been a desire to get away from the awkward tablet armchairs and into a more comfortable seating method. As more instructors want to involve students in collaborative learning activities, often asking two or more students to work together on class projects, the need for more space per person has been apparent. In addition, the use of technology adds space in selected situations in assuring appropriate sight lines and additional space for computers where those are involved. The Americans With Disabilities Act has resulted in additional space in some instances, to assure access for the disabled.

After analyzing the utilization factors and the existing space per FTE, the consultants recommend the following changes to the space needs model for classroom space:

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Existing ASF per Student FTE</i>	<i>Range of ASF</i>	<i>Institution Average ASF per Student FTE</i>	<i>Space Model Recommendation (ASF per Student FTE)</i>
Doctoral Universities	364,648	9	8 – 10	9	10 ASF, No Change
Comprehensive Universities	849,439	15	10–21	16	12 ASF
Community & Technical Colleges	875,234	17	9 – 37	19	15 ASF

Laboratory Space (200's)

Teaching Laboratory Space (210's)

The amount of space in this category varies greatly depending on the program mix. As background, here is what some other states have done in their space models. Utah used a factor of 10 ASF per FTE for teaching labs, with an additional 8 ASF per FTE for those institutions with vocational/technical programs. The Texas Coordinating Board uses a core allocation of 8 ASF per FTE (plus, it is reasonable to allocate two gsf per FTE of the service space they provide, resulting in 10 ASF per FTE). They provide additional space for 4-year institutions based on specific degree programs, so that university programs in agriculture, sciences, visual and performing arts would get additional space, either 15 or 30 square feet per FTE depending on the specific program. The Texas Coordinating Board goes further for the technical colleges. There are factors as high as an additional 75 ASF per FTE for the heavy technology programs including auto machinery, construction, fire, and cosmetology, with

smaller amounts for other programs, for example 45 ASF per FTE for vocational nursing, allied health, and printing and graphics.

While it would be ideal to create a model more sensitive to program offerings, this approach is more complex and requires more detailed base data. The consultants recommended that KCPE consider this type of approach in the future. After reviewing the existing the Fall 2005 utilization rates provided by the Council, the consultants do not recommend any changes in this category.

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Existing ASF per Student FTE</i>	<i>Range of ASF</i>	<i>Institution Average ASF per Student FTE</i>	<i>Space Model Recommendation (ASF per Student FTE)</i>
Doctoral Universities	298,502	8	5 – 9	7	8 ASF, No Change
Comprehensive Universities	532,047	9	6 – 25	12	10 ASF, No Change
Community & Technical Colleges	1,459,971	29	13–66	33	30 ASF, No Change

Open Laboratories (220's)

Open Laboratories are irregularly scheduled or unscheduled. This includes labs that are used exclusively for one semester, open access labs, and self-paced labs. It includes labs that have a limited amount of regularly scheduled courses held in it and are used as open labs the rest of the time. A good example of this would be a skills lab for a nursing program. In other labs, students may work on a self-paced basis. They may schedule themselves in at specific hours of each day, but a class does not meet in a formal setting with a given start time and stop time. Some labs could be in this category because they are dedicated to a particular course which may have a specific meeting time, but students also come into the lab at other hours and utilize the lab in a way that prevents it being used by other courses.

Other states that have used this method have allocated seven or eight square feet per full-time equivalent student. Utah allocated seven ASF. Texas technically allocates six ASF, but a reasonable interpretation of its service space category would provide two ASF for the open labs, for a total of eight ASF per FTE. In other modeling studies conducted by the consultants, a low of five (5) ASF per student FTE and as much as eight (8) ASF per student FTE have been implemented. The consultants do not recommend any changes to the model in this category.

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Existing ASF per Student FTE</i>	<i>Range of ASF</i>	<i>Institution Average ASF per Student FTE</i>	<i>Space Model Recommendation (ASF per Student FTE)</i>
Doctoral Universities	287,811	8	6 – 10	8	8 ASF, No Change
Comprehensive Universities	505,536	9	4 – 15	9	8 ASF, No Change
Community & Technical Colleges	123,110	2	.48 – 8	3	7 ASF, No Change

Research Laboratories (250's)

The space coded as research/non-class lab space, which used to have the federal coding title Non-Class Lab space, includes small amounts of space at community colleges and at technical colleges. After Paulien & Associates created the space needs model in 1999, KCPE wanted a more extensive review of the research laboratory guideline. While there was no change in the guideline for the comprehensive universities, the modeling factor for the doctoral universities was modified to reflect a sliding scale based upon the total amount of research expenditures. At this time the consultants have no further changes to this modeling factor.

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Research Expenditures</i>	<i>Range of ASF per \$100,000</i>	<i>Institution Average ASF per \$100,000</i>	<i>Space Model Recommendation (ASF per \$100,000 in Research Expenditures)</i>
Doctoral Universities	1,174,040	\$311,592,010	360 - 385	372	900 ASF/\$100,000 for first \$50M in R&D Expenditures, 600 ASF/\$100,000 for second \$50M up to \$100M, and 350 ASF/\$100,000 over \$100M, No Change
Comprehensive Universities	95,552	\$22,482,845	162 – 1,239	603	700 ASF/\$100,000, No Change
Community & Technical Colleges	10,017	n/a	n/a	n/a	This space should be added to the Open Laboratory category

Office Space (300's)

Office space usually consists of at least three types of space: offices and workstations; conference rooms; and office service space. Office service space includes work rooms, supply rooms, reception areas, and other rooms usually found in an office suite. The most appropriate way to evaluate office space needs is on a space per FTE employee basis for employees who require offices.

In looking at how other states approach this category, those that do space on a square foot per full-time equivalent employee basis include New Jersey which provides 160 ASF per FTE, and Utah which provides 195 ASF per FTE for the research universities, 170 ASF per FTE for the state universities and for rural community colleges (true junior colleges), and 150 ASF per FTE for urban community colleges (comprehensive, including vocational/technical two-year programs). The Texas Coordinating Board uses 190 ASF per FTE for faculty and 170 ASF per FTE for non-faculty individuals.

The existing amount of space per staff FTE is high at the comprehensive universities (227 ASF per staff FTE) and community and technical colleges (168 ASF per staff FTE). Based on observation from the Educational Adequacy and Fit for Continued Use study, the consultants felt that this high square footage is because of older buildings that were built with larger offices. Keeping the space factor low results in a false “surplus of space” finding. To determine the real need for office space for this level of analysis, the consultants felt that increasing the modeling factor to 195 ASF for the comprehensive universities and 170 ASF for the community and technical colleges would provide KCPE with a better take on the need for office space at its institutions.

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Existing ASF per Staff FTE</i>	<i>Range of ASF</i>	<i>Institution Average ASF per Staff FTE</i>	<i>Space Model Recommendation (ASF per Staff FTE)</i>
Doctoral Universities	2,286,588	215	179 – 245	212	195 ASF, No Change
Comprehensive Universities	1,747,624	227	198 – 324	235	195 ASF
Community & Technical Colleges	792,035	168	105 – 250	171	170 ASF

Library Space (400's)

Library space is included in the model. It was determined not to apply a traditional library space needs guideline in Kentucky because, with the development of the Kentucky Virtual Library, it is assumed that the need for additional library space will have been substantially met. Administrators of the Kentucky Virtual Library note that the Virtual Library may in some cases increase the need for reader station space. For the Kentucky space needs model, the recommendation is that existing library space be utilized as the guideline in the model and that any additional needs for library would have to be separately and specifically justified by the institution. No changes are recommended in this space category.

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Existing ASF per Student FTE</i>	<i>Range of ASF</i>	<i>Institution Average ASF per Student FTE</i>	<i>Space Model Recommendation</i>
Doctoral Universities	730,193	19	18–20	19	Existing Space carried Forward
Comprehensive Universities	554,742	10	7 – 20	11	Existing Space carried Forward
Community & Technical Colleges	228,407	5	1 – 10	5	Existing Space carried Forward

Physical Education and Recreation Space (520's)

A decision was made early in the planning process to exclude athletics from this category. The consultants have found that the most reliable physical education/recreation model is one developed at the University of Illinois in the 1960s by Harlan Bareither and Jerry Schillinger, and published in their book *University Space Planning*. This model said that for all active physical education users, a total of 12.1 square feet should be provided for both activity space and support space such as locker rooms. They proposed that this model amount be applied to all undergraduates, to 25% of the graduate students, and to 15% of the employees at the institution.

A 75,000 ASF minimum was utilized for the doctoral universities and the comprehensive universities. The minimum was the amount utilized at Kentucky State University and Morehead State University. All others generated more than the minimum.

Less than half the community and technical colleges showed space in this category, and in most places it was just one or two rooms all under 2,500 ASF, with the exception of West Kentucky Community and Technical College which has a full gymnasium. All existing space was carried forward. If any community and technical college proposes additional space in this category, they will need to justify it specifically.

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Existing ASF per Student FTE</i>	<i>Range of ASF</i>	<i>Institution Average ASF per Student FTE</i>	<i>Space Model Recommendation (ASF per User FTE)</i>
Doctoral Universities	214,143	5	5 – 6	6	12.1 ASF for 100% Undergraduate Student FTE, 25% of Graduate FTE, and 15% of Staffing FTE (75,000 ASF minimum), No Change
Comprehensive Universities	725,381	13	4 – 59	20	12.1 ASF for 100% Undergraduate Student FTE, 25% of Graduate FTE, and 15% of Staffing FTE (75,000 ASF minimum), No Change
Community & Technical Colleges	19,250	0	.24 – 3	1	No Standard, No Change

Special Use (500's) and General Use (600's) Facilities

This space grouping includes a wide variety of space. It includes the following room use codes:

SPECIAL USE FACILITIES

- 510 Armory
- 530 Media Production
- 540 Clinic
- 550 Demonstration
- 560 Field Building
- 570 Animal Quarters
- 580 Greenhouse
- 590 General Purpose

GENERAL USE FACILITIES

- 610 Assembly
- 620 Exhibition
- 630 Food Facilities
- 640 Day Care
- 650 Lounges
- 660 Merchandising
- 670 Recreation Space
- 680 Meeting Rooms (not auxiliary funded)

The consultants have found that the results in this category vary widely from campus to campus, and from space type to space type when these are compared across state lines. Therefore, the recommendations for these types of facilities are based primarily on analysis of the existing amounts of space for the Kentucky institutions. There are no changes to the space factor in this category.

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Existing ASF per Student FTE</i>	<i>Range of ASF</i>	<i>Institution Average ASF per Student FTE</i>	<i>Space Model Recommendation (ASF per Student FTE)</i>
Doctoral Universities	848,268	22	21–22	22	21 ASF, No Change
Comprehensive Universities	940,390	16	7 – 32	19	18 ASF, No Change
Community & Technical Colleges	251,707	6	.41–25	8	12 ASF, No Change

Support Space (700's)

This category consists of central computer and telecommunications facilities, central storage facilities, indoor vehicle storage, central services, and hazardous materials facilities. This space is often looked at as a percentage of other campus space, so that as the campus space inventory increases, the need for support space would also increase. The need for such space can vary depending on whether there are power plants on the campus or whether utility services are purchased from public utilities. Indoor vehicle storage has been removed from the analysis. The amounts of space tend to be greater at more complex institutions. The amounts of space in this category for the Kentucky types of institutions are as follows.

While the base space factor has not changed for any institution type, the consultants felt it necessary to include a factor for those institutions with land grant missions – University of Kentucky and Kentucky State University. Institutions with land grant missions tend to have more support space than at other institutions. It is recommended that an additional 4 ASF per student FTE be added for UK and KSU.

FINDING:

<i>Institution Type</i>	<i>Assignable Square Feet (ASF)</i>	<i>Existing ASF per Student FTE</i>	<i>Range of ASF</i>	<i>Institution Average ASF per Student FTE</i>	<i>Space Model Recommendation (ASF per Student FTE)</i>
Doctoral Universities	588,892	15	4 – 23	14	8 ASF per Student FTE plus 4 ASF per Student FTE if land grant mission
Comprehensive Universities	426,966	7	3 – 18	10	8 ASF per Student FTE plus 4 ASF per Student FTE if land grant mission
Community & Technical Colleges	251,707	5	2 – 19	6	4 ASF, No Change